

Amendments to the Specification:

The following replacement paragraphs are presented:

Please substitute the Attached Sequence listing (23 pages) for the corresponding Sequence Listing in the Application. A computer readable form is also provided on floppy disk, and this is identical to the printed copy.

On pages 16-19:

Table 2. Proline mutations to improve thermal tolerance.

Mutation	Native sequence and mutagenic oligonucleotide
SEQ ID NO: <u>2310</u> <i>S8P - native sense strand</i>	5'-GCACTCTCCAATCGGAGACTCACCCG-3'
SEQ ID NO: <u>24111</u> Mutagenic sense strand	5'-GCACTCTCCAAC <u>CC</u> GGAGACTCACCCG-3'
SEQ ID NO: <u>2512</u> Mutagenic anti-sense strand	5'-CGGGTGAGTCTCC <u>GG</u> TTGGAGAGTGC-3'
SEQ ID NO: <u>2613</u> <i>N27P - native sense strand</i>	5'-GGCACGTGCACTCAACAGACAGGCTCCG-3'
SEQ ID NO: <u>2714</u> Mutagenic sense strand	5'-GGCACGTGCACTC <u>C</u> ACAGACAGGCTCCG-3'
SEQ ID NO: <u>2815</u> Mutagenic anti-sense strand	5'-CGGAGCCTGTCTGT <u>G</u> GAGTGCACGTGCC-3'
SEQ ID NO: <u>2916</u> <i>A43P - native sense strand</i>	5'-GGCGCTGGACTCACGCTACGAACAGCAGCACG-3'
SEQ ID NO: <u>3017</u> Mutagenic sense strand	5'-GGCGCTGGACTCAC <u>CC</u> TACGAACAGCAGCACG-3'
SEQ ID NO: <u>3118</u> Mutagenic anti-sense strand	5'-CGTGCTGCTGTTCGTAG <u>GG</u> TGAGTCCAGCGCC-3'
SEQ ID NO: <u>3219</u> <i>G75P - native sense strand</i>	5'-GCTGTCTGGACGGTGCCGCCTACGCG-3'
SEQ ID NO: <u>3320</u> Mutagenic sense strand	5'-GCTGTCTGGAC <u>CC</u> TGCCGCCTACGCG-3'
SEQ ID NO: <u>3421</u> Mutagenic anti-sense strand	5'-CGCGTAGGCGGCAG <u>GG</u> TCCAGACAGC-3'
SEQ ID NO: <u>3522</u> <i>G94P - native sense strand</i>	5'-GCCTCTCCATTGGCTTTGTCACCC-3'
SEQ ID NO: <u>3623</u>	5'-GCCTCTCCATT <u>CC</u> CTTTGTCACCC-3'

Mutagenic sense strand	
SEQ ID NO: <u>3724</u>	5'-GGGTGACAAAG <u>GGA</u> ATGGAGAGGC-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>3825</u>	5'-GGCCAACGTTGAGGGCTGGGAGCC-3'
<i>E190P - native sense strand</i>	
SEQ ID NO: <u>3926</u>	5'-GGCCAACGTT <u>CCG</u> GGCTGGGAGCC-3'
Mutagenic sense strand	
SEQ ID NO: <u>4027</u>	5'-GGCTCCCAGCCC <u>GGA</u> ACGTTGGCC-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>4128</u>	5'-GGCTGGGAGCCGTCATCCAACAACGCG-3'
<i>S195P - native sense strand</i>	
SEQ ID NO: <u>4229</u>	5'-GGCTGGGAGCCG <u>CC</u> ATCCAACAACGCG-3'
Mutagenic sense strand	
SEQ ID NO: <u>4330</u>	5'-CGCGTTGTTGGAT <u>TGG</u> CGGCTCCCAGCC-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>4431</u>	5'-CGATACCACCAAGAAATTGACCGTTGTCACCC-3'
<i>K287P - native sense strand</i>	
SEQ ID NO: <u>4532</u>	5'-CGATACCACCAAG <u>CC</u> ATTGACCGTTGTCACCC-3'
Mutagenic sense strand	
SEQ ID NO: <u>4633</u>	5'-GGGTGACAACGGTCAAT <u>TGG</u> CTGGTGGTATCG-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>4734</u>	5'-CGAGACGTCGGGTGCCATCAACCGATAC-3'
<i>A299P - native sense strand</i>	
SEQ ID NO: <u>4835</u>	5'-CGAGACGTCGGGT <u>CCC</u> ATCAACCGATAC-3'
Mutagenic sense strand	
SEQ ID NO: <u>4936</u>	5'-GTATCGGTTGAT <u>TGG</u> ACCCGACGTCTCG-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>5037</u>	5'-GGCGTCACTTTCCAGCAGCCCAACGCCGAGCTTGG-3'
<i>Q312P/N315P - native sense strand</i>	
SEQ ID NO: <u>5138</u>	5'-GGCGTCACTTTCC <u>CG</u> CAGCCCC <u>CC</u> GCCGAGCTTGG-3'
Mutagenic sense strand	
SEQ ID NO: <u>5239</u>	5'-CCAAGCTCGGCG <u>G</u> GGGGCTGC <u>G</u> GGAAGTGACGCC-3'
Mutagenic anti-sense strand	
SEQ ID NO: <u>5340</u>	5'-GGCTACCTCTGGCGGCATGGTTCTGG-3'
<i>G359P - native sense strand</i>	
SEQ ID NO: <u>5441</u>	5'-GGCTACCTCT <u>CCC</u> GGCATGGTTCTGG-3'
Mutagenic sense strand	

SEQ ID NO: <u>5542</u> Mutagenic anti-sense strand	5'-CCAGAACCATGCC <u>GG</u> AGAGGTAGCC-3'
SEQ ID NO: <u>5643</u> <i>S398P/S401 P</i> - native sense strand	5'-GCGGAAGCTGCTCCACCAGCTCCGGTGTCCCTGC-3'
SEQ ID NO: <u>5744</u> Mutagenic sense strand	5'-GCGGAAGCTGCC <u>CC</u> ACCAGC <u>CC</u> GGTGTCCCTGC-3'
SEQ ID NO: <u>5845</u> Mutagenic anti-sense strand	5'-GCAGGGACACCG <u>GG</u> GCTGGTGG <u>G</u> GCAGCTTCCGC-3'
SEQ ID NO: <u>5946</u> <i>A414P</i> - native sense strand	5'-GTCTCCCAACGCCAAGGTCACC-3'
SEQ ID NO: <u>6047</u> Mutagenic sense strand	5'-GTCTCCCAAC <u>CC</u> CAAGGTCACC-3'
SEQ ID NO: <u>6148</u> Mutagenic anti-sense strand	5'-GGTGACCTTGG <u>G</u> GTTGGGAGAC-3'
SEQ ID NO: <u>6249</u> <i>N431P/S433P</i> - native sense strand	5'-GGCAGCACCGGCAACCCTAGCGGCGGCAACCC-3'
SEQ ID NO: <u>6350</u> Mutagenic sense strand	5'-GGCAGCACCGGC <u>CCC</u> CT <u>CCC</u> GGCGGCAACCC-3'
SEQ ID NO: <u>6451</u> Mutagenic anti-sense strand	5'-GGGTTGCCGCC <u>GGG</u> AGGG <u>GGG</u> CCGGTGCTGCC-3'

Table 3. Mutation to remove peptide strain.

Mutation site	Native sequence and mutagenic oligonucleotide
SEQ ID NO: <u>6552</u> <i>S99G</i> - native sense strand	5'-GGCTTTGTCACCCAGTCTGCGCAGAAGAACGTTGGC-3'
SEQ ID NO: <u>6653</u> Mutagenic sense strand	5'-GGCTTTGTCACCCAG <u>GG</u> TGCGCAGAAGAACGTTGGC-3'
SEQ ID NO: <u>6754</u> Mutagenic anti-sense strand	5'-GCCAACGTTCTTCTGCGCA <u>CC</u> CTGGGTGACAAAGCC-3'

Table 3b. Y245G analogs to remove product inhibition.

Mutation site	Native sequence and mutagenic oligonucleotide
SEQ ID NO: <u>6855</u> <i>R251A</i> - native sense strand	5'-CCGATAACAGATATGGCGGC-3'
SEQ ID NO: <u>6956</u> Mutagenic sense strand	5'-CCGATAAC <u>GC</u> CTATGGCGGC-3'
SEQ ID NO: <u>7057</u> Mutagenic anti-sense strand	5'-GCCGCCATAG <u>GGC</u> GTTATCGG-3'

SEQ ID NO: <u>7158</u> <i>R394A- native sense strand</i>	5'-CCCGGTGCCGTGCGCGGAAGCTGCTCCACC-3'
SEQ ID NO: <u>7259</u> Mutagenic sense strand	5'-CCCGGTGCCGTG <u>GCC</u> GGAAGCTGCTCCACC-3'
SEQ ID NO: <u>7360</u> Mutagenic anti-sense strand	5'-GGTGGAGCAGCTTCCG <u>GCC</u> CACGGCACCGGG-3'
SEQ ID NO: <u>7461</u> <i>F338A- native sense strand</i>	5'-GCTGAGGAGGCAGAATTCCGGCGGATCCTCTTTCTC-3'
SEQ ID NO: <u>7562</u> Mutagenic sense strand	5'-GCTGAGGAGGCAGAA <u>GCC</u> GCGGATCCTCTTTCTC-3'
SEQ ID NO: <u>7663</u> Mutagenic anti-sense strand	5'-GAGAAAGAGGATCCGCC <u>GGC</u> TTCTGCCTCCTCAGC-3'
SEQ ID NO: <u>7764</u> <i>R267A- native sense strand</i>	5'-GGAACCCATACCGCCTGGGCAACACCAGC-3'
SEQ ID NO: <u>7865</u> Mutagenic sense strand	5'-GGAACCCATAC <u>GCC</u> CCTGGGCAACACCAGC-3'
SEQ ID NO: <u>7966</u> Mutagenic anti-sense strand	5'-GCTGGTGTTGCCCAGG <u>GCG</u> TATGGGTTCC-3'
SEQ ID NO: <u>8067</u> <i>E385A- native sense strand</i>	5'-CCTACCCGACAAACGAGACCTCCTCCACACCCGG-3'
SEQ ID NO: <u>8168</u> Mutagenic sense strand	5'-CCTACCCGACAAAC <u>GCC</u> ACCTCCTCCACACCCGG-3'
SEQ ID NO: <u>8269</u> Mutagenic anti-sense strand	5'-CCGGGTGTGGAGGAGGT <u>GCG</u> TTTGTGGGTAGG-3'

Table 4. N to A mutations to remove glycosylation.

Mutant	Native sequence and mutagenic oligonucleotide
SEQ ID NO: <u>2070</u> <i>N45A - native sense strand</i>	5'-GGA CTCACGCTACGAA CAGCAGCACGAACTGC-3'
SEQ ID NO: <u>8371</u> Mutagenic sense strand	5'-GGA CTCACGCTACG <u>GCC</u> CAGCAGCACGAACTGC-3'
SEQ ID NO: <u>8472</u> Mutagenic anti-sense strand	5'-GCAGTTCGTGCTGCT <u>GCC</u> GTAGCGTGAGTCC-3'
SEQ ID NO: <u>8573</u> <i>N270A - native sense strand</i>	5'-CCCATACCGCCTGGGCAACACCAGCTTCTACGGCCC-3'
SEQ ID NO: <u>8574</u> Mutagenic sense strand	5'-CCCATACCGCCTGGG <u>GCC</u> CACCAGCTTCTACGGCCC-3'
SEQ ID NO: <u>8675</u>	5'-GGGCCGTAGAAGCTGGT <u>GCG</u> CCCAGGCGGTATGGG-3'

Mutagenic anti-sense strand	
SEQ ID NO: <u>2276</u> <i>N384A - native sense strand</i>	5'-GGACTCCACCTACCCGACAAACGAGACCTCCTCCACACCCG-3'
SEQ ID NO: <u>8777</u> Mutagenic sense strand	5'-GGACTCCACCTACCCGACA <u>G</u> CCGAGACCTCCTCCACACCCG-3'
SEQ ID NO: <u>8878</u> Mutagenic anti-sense strand	5'-CGGGTGTGGAGGAGGTCTCG <u>G</u> CTGTCGGGTAGGTGGAGTCC-3'

Table 5. Helix capping mutations to improve thermal tolerance.

Mutant	Native sequence and mutagenic oligonucleotide
SEQ ID NO: <u>8979</u> <i>E337R - native sense strand</i>	5'-GCTGAGGAGGCAGAAATTCGGCGG-3'
SEQ ID NO: <u>9080</u> Mutagenic sense strand	5'-GCTGAGGAGGCAC <u>G</u> GCTTCGGCGG-3'
SEQ ID NO: <u>9181</u> Mutagenic anti-sense strand	5'-CCGCCGAAG <u>G</u> CGTGCCTCCTCAGC-3'
SEQ ID NO: <u>9282</u> <i>N327D - native sense strand</i>	5'-GGCAACGAGCTCAACGATGATTACTGC-3'
SEQ ID NO: <u>9383</u> Mutagenic sense strand	5'-GGCAACGAGCTC <u>G</u> ACGATGATTACTGC-3'
SEQ ID NO: <u>9484</u> Mutagenic anti-sense strand	5'-GCAGTAATCATCGT <u>C</u> GAGCTCGTTGCC-3'
SEQ ID NO: <u>9585</u> <i>A405D - native sense strand</i>	5'-CCGGTGTCCCTGCTCAGGTCGAATCTCAGTCTCCC-3'
SEQ ID NO: <u>9686</u> Mutagenic sense strand	5'-CCGGTGTCCCTG <u>A</u> TCAGGTCGAATCTCAGTCTCCC-3'
SEQ ID NO: <u>9787</u> Mutagenic anti-sense strand	5'-GGGAGACTGAGATTCGACCTGA <u>T</u> CAGGGACACCCG-3'
SEQ ID NO: <u>9888</u> <i>Q41OR - native sense strand</i>	5'-GCTCAGGTCGAATCTCAGTCTCCCAACGCC-3'
SEQ ID NO: <u>9989</u> Mutagenic sense strand	5'-GCTCAGGTCGAATCTC <u>G</u> GCTCTCCCAACGCC-3'
SEQ ID NO: <u>10090</u>	5'-GGCGTTGGGAGAG <u>C</u> GAGATTCGACCTGAGC-3'

Mutagenic anti-sense strand	
SEQ ID NO: 40191 <i>N64D - native sense strand</i>	5'-CCCTATGTCCTGACAACGAGACCTGCGCG-3'
SEQ ID NO: 40292 Mutagenic sense strand	5'-CCCTATGTCCTGACGACGAGACCTGCGCG-3'
SEQ ID NO: 40393 Mutagenic anti-sense strand	5'-CGCGCAGGTCTCGTCGTCAGGACATAGGG-3'
SEQ ID NO: 40494 <i>N64D - native sense strand</i>	5'-GCTCGACCCTATGTCCTGACAACGAGACCTGCGCGAAGAACTGC-3'
SEQ ID NO: 40595 Mutagenic sense strand	5'-GCTCGACCCTATGTCCTGACGACGAGACCTGCGCGAAGAACTGC-3'
SEQ ID NO: 40696 Mutagenic anti-sense strand	5'-GCAGTTCTTCGCGCAGGTCTCGTCGTCAGGACATAGGGTCGAGC-3'